This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-5. (cancelled).

6. (currently amended) A particle beam device which operates upon a test subject, wherein at least a portion of the particle beam device is maintained in a vacuum, the particle beam device comprising at least:

a particle generator;

at least a first particle ~~focussing~~ focusing device, the particle generator and the at least first particle ~~focussing~~ focusing device together being formed into a first particle beam column; ~~and~~

a plurality of air bearings to support the particle beam column and to permit the particle beam column to move in a nearly frictionless manner across a top surface of a first support table;

a sample holding station located within the top surface of the first support table, the sample holding station holding at least a first surface of a test object in an essentially co-planar relationship with the top surface of the first support table, wherein the sample holding station comprises at least a well in the top surface of the first support table for receiving the test object therein, and wherein the sample holding station further comprises a plurality of lifter assemblies and a vacuum chuck, the lifter assemblies in a first extended position receiving the test object and in a second, compressed position holding the test object in proximity to the vacuum chuck so that the vacuum chuck can hold the test object, the compressed position being such that the top surface of the test object is held in a co-planar relationship with the top surface of the first support table; and

an air bearing leveling tool for placing the test object into the second, compressed position, the air bearing leveling tool having a plurality of air bearings which are applicable to the top surface of the test object to thereby force the test object and the lifter assemblies into the second, compressed position.

7. (currently amended) The particle beam device of claim 6 wherein a staged vacuum seal is fitted to the particle beam column between the at least first particle ~~focussing~~ focusing device and the top surface of the first support table, the staged vacuum seal creating a plurality of concentric, reduced pressure zones around the first particle beam column.

8. (original) The particles beam device of claim 7 wherein the staged vacuum seal is comprised of a plurality of nested circles, the innermost reduced pressure zone having a circular cross section and succeeding reduced pressure zones have a torroidal cross section surrounding the innermost circular reduced pressure zone.

9. (original) The particle beam device of claim 8 wherein the innermost circular reduced pressure zone has a first predefined air pressure that permits operation of the particle beam within the innermost circular reduced pressure zone.

10. (original) The particle beam device of claim 9 wherein each succeeding torroidal reduced pressure zone has an air pressure greater than the preceding reduced pressure zone.

11. (cancelled)

12. (currently amended) The particle beam device of claim ~~11~~ 6 wherein the test object comprises a semiconductor wafer of first predetermined diameter and the ~~sample holding station comprises at least a circular~~ well of the sample holding station is circular and has a ~~of first~~ second predetermined diameter at least equal to the first predetermined diameter ~~in the top surface of the first support table~~.

13. (cancelled)

14. (currently amended) The particle beam device of claim ~~13~~ 12 ~~wherein~~ a the ~~air bearing leveling tool is used to place the semiconductor wafer into the second, compressed position, the tool comprising a~~ plurality of air bearings are fixed into a rigid frame, an active, gas bearing surface of each of the air bearings being held in a co-planar relationship with all the other active, gas bearing surfaces of the air bearings, the frame having a predetermined diameter greater that the semiconductor wafer's diameter, the active, gas bearing surfaces being applied to the top surface of the semiconductor wafer and forcing the wafer and the lifter assemblies into the second, compressed position during operation of the particle beam device.

15. (original) The particle beam device of claim 14 wherein the lifter assemblies are filled with a low melting point metal alloy, heat being applied to the lifter assemblies when the lifter assemblies are required to move from the first position to the second position and when the lifter assemblies are required to move from the second position to the first position, heat being removed and the metal alloy solidifying, fixing the lifter assemblies into position at all other times.

16-19. (cancelled).

20. (new) A particle beam device which operates upon a test object, comprising:

a particle beam imaging column for directing a particle beam towards a test object;

a sample holding station for holding at least a first surface of the test object in an essentially co-planar relationship with a top surface of a support, wherein the sample holding station comprises at least a well in the top surface of the support for receiving the test object therein, and wherein the sample holding station further comprises a plurality of lifter assemblies and a vacuum device, the lifter assemblies in a first extended position receiving the test object and in a second, compressed position holding the test object in proximity to the vacuum device

so that the vacuum device can hold the test object, the compressed position being such that the top surface of the test object is held in a co-planar relationship with the top surface of the support; and

an air bearing leveling tool for placing the test object into the second, compressed position, the air bearing leveling tool having a plurality of air bearings which are applicable to the top surface of the test object to thereby force the test object and the lifter assemblies into the second, compressed position.

21. (new) The particle beam device of claim 20 wherein the test object comprises a semiconductor wafer of first predetermined diameter and the well of the sample holding station is circular and has a second predetermined diameter at least equal in size to the first predetermined diameter.

22. The particle beam device of claim 20 wherein the plurality of air bearings are fixed into a rigid frame, an active, gas bearing surface of each of the air bearings being held in a co-planar relationship with all the other active, gas bearing surfaces of the air bearings, the frame having a predetermined size greater that the test object's size, the active, gas bearing surfaces being applied to the top surface of the test object and forcing the test object and the lifter assemblies into the second, compressed position.

23. (new) The particle beam device of claim 22 wherein the lifter assemblies are filled with a low melting point metal alloy, heat being applied to the lifter assemblies when the lifter assemblies are required to move from the first position to the second position and when the lifter assemblies are required to move from the second position to the first position, heat being removed and the metal alloy solidifying, fixing the lifter assemblies into position at all other times.

24. (new) A method of using a particle beam device to inspect or measure a test object, the particle beam device having a particle beam imaging column for directing a particle beam

towards the test object, a sample holding station for holding at least a first surface of a test object in an essentially co-planar relationship with a top surface of a support, wherein the sample holding station comprises at least a well in the top surface of the support for receiving the test object therein, and wherein the sample holding station further comprises a plurality of lifter assemblies and a vacuum device, the lifter assemblies in a first extended position receiving the test object and in a second, compressed position holding the test object in proximity to the vacuum device so that the vacuum device can hold the test object, the compressed position being such that the top surface of the test object is held in a co-planar relationship with the top surface of the support, and an air bearing leveling tool for placing the test object into the second, compressed position, the air bearing leveling tool having a plurality of air bearings which are applicable to the top surface of the test object to thereby force the test object and the lifter assemblies into the second, compressed position, the method comprising the steps of:

placing a first surface of the test object in a co-planar relationship with the first surface of the support by moving the air bearing leveling tool and the test object towards each other so that the air bearing of the leveling tool contact the test object and force the test object and lift assemblies into the second, compressed position; and

moving the particle beam generated by the particle beam imaging column over the first surface of the test object while the first surface is held in its co-planar relationship with the first surface of the support.

25. The method of claim 24 wherein a plurality of air bearings are attached to the particle beam device and permit its substantially frictionless motion of the particle beam imaging column over the first surface, the method further comprising moving the particle beam imaging column over the first surface of the test object, wherein the movement is substantially frictionless.

26. The method of claim 24 wherein a staged seal vacuum generator is attached to the particle beam device so that the particle beam device will continue to operate in a substantial vacuum even while moving over the first surface of the test object.

27. The method of claim 26 wherein the first surface of the test object comprises a first, device-fabrication side of a semiconductor wafer.